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SUPPORT FOR LEBANON'S ACCESSION TO THE WORLD TRADE ORGANIZATION (WTO)

Regulatory Impact Analysis of the Establishment of Planned Industrial Parks in the Suburbs of SAIDA.

SUPPORT FOR LEBANON'S ACCESSION TO THE WORLD TRADE
ORGANIZATION (WTO) PROJECT

October 2012

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INTRODUCTION

The industrial sector in Lebanon has experienced significant development since the end of the war. Coupled with a weak infrastructure and low levels of investment, inadequate reforms have contributed to undermine the industrial sector and its ability to expand domestically and develop an export capability, constraining growth.

Currently, the industrial sector accounts for approximately 16% of Lebanon's GDP. However, despite the important role that the industrial sector plays as a major source of employment, the sector conversely generates industrial effluents, solid waste and potentially toxic air emissions. Presently, the industrial agglomerations in the south of Lebanon (*same as in all industrial agglomerations in Lebanon*) are responsible for most of the liquid, solid and gaseous emissions discharged into the environment without any form of treatment.

This is due to the lack of appropriate industrial parks and government enforcement. Locally grown businesses in the south of Lebanon seeking to locate or expand in the region have difficulty finding a suitable place to build their facilities and are forced to move to another region or to build their facilities with unenforceable pollution control regulations.

While recognizing the need to support the industrial sector in the South of Lebanon and the necessity for improving its infrastructure, the Chamber of Commerce Industry and Agriculture of Saida and South (CCIAS) has worked to identify appropriate land, change its regulation to allow for hosting industrial activities, identify investors to buy the land and build the appropriate infrastructure to better serve the industrialists and relieve some of the burden on the environment.

In this context, the CCIAS has integrated the Regulatory Impact Assessment concept (RIA) into the **intended** process in order to identify the potential impacts of the new land regulation. The CCIAS has collaborated with the WTO Project to analyze the impact of changing the classification of the selected land and drafting the first iteration of the RIA report.

RIA REPORT

This report was prepared on behalf of CCIAS with the assistance of the WTO Project RIA Consultants and the Working Group.

The WTO Project RIA Consultants were composed of:

Zouha Saker, Project COP

Mark Gerner, Associate Business Analytics from Booz | Allen | Hamilton.

The Working Group was composed of representatives of private sector business stakeholders:

Mohammed Hussein Saleh, President of the CCIAS and Head of the Southern Industrialists syndicate

Hassan Mohammed Hussein, industrialist

Yehia Mohammed Jouni, Head of Roumin Municipality and industrialist

Lead by Mr. Andraos Bacha with cooperation with WTO Project RIA Consultants

The objective of this report is to support the CCIAS in the creation of a solid understanding of the cost and benefit analysis associated with the creation of an industrial park and use it as a

toolkit in their dialogue with the concerned government authorities. This document is not, and cannot be imperative to classify the land. Rather, it is a document intended to serve as a useful starting point in discussions with the government on the impact of the creation of an industrial park.

The report is composed of four sections:

Section A: Presents an overview of the industrial sector in Lebanon, Identifies suitable industrial sectors to be hosted in the industrial park from environmental and economic impact perspectives, evaluates and selects the land that facilitates the development of the identified industrial activities.

Section B: Develops an environmental impact statement that briefly describes the areas to be affected or created by the zoning under consideration.

Section C: Elaborates a preliminary land-use layout plan of the area by type of industry and estimates cost of the general infrastructure development.

Section D: Assesses the impact the potential industrial park that could have on the economy of the region and concludes quantification and valuation of outcomes for the RIA report

SECTION A

OVERVIEW OF THE INDUSTRIAL SECTOR, SITE SELECTION AND IDENTIFICATION OF SUITABLE INDUSTRIAL SECTORS TO BE HOSTED IN THE INDUSTRIAL PARK FROM ENVIRONMENTAL AND ECONOMIC IMPACT PERSPECTIVES.

1. Methodology used

The identification and selection of sectors were performed in consultation with the Working Group. The selected industries will include those identified as class II, III, IV and V.¹

The methodology consists of 1) initial consultation by the Working Group and review of applicable regulations, 2) potential site assessments and 3) recommendation of required zoning amendments.

The initial consultation with the working group was based on information gathered on sector performance in Lebanon as well as in the south of Lebanon. The purpose was to collect data on the current industrial output by industry sector at the national level and discuss it with the working group to better identify the type of activity that suits the region.

The selection of the appropriate economic-industrial activities was in line with the current requirements of companies in the region, projection needs and in conformity with environmental quality standards. The industries were grouped in accordance with the Lebanese Classification Standards of Industrial Activities.

The selected site has been chosen to facilitate the development of the identified industrial activities. The Working Group has proposed two potential sites. Each site was scored according to area size, topography, general environmental condition, access to utilities, access to labor, current economic activity and current zoning regulations. Criteria were determined through review of official cadastral directives and applicable regulations, field visits and satellite imagery analysis.

2. Industry overview

The Ministry of Industry (Mol) in Lebanon initiated in cooperation with Association of the Lebanese Industrialists (ALI) and with the technical assistance of UNIDO, a survey in 2009-2010 covering all establishments employing no less than five workers. The aim of the survey was to map the industries, define the profile of industrial establishments and evaluate their activities and financial performances. Hereafter is a brief of main findings of the survey covering the characteristics of the sector and related quantitative analysis.

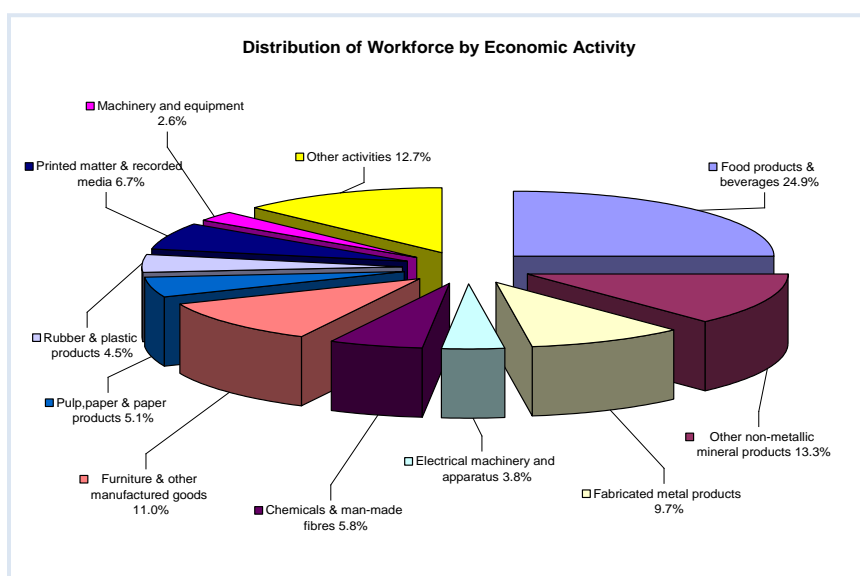
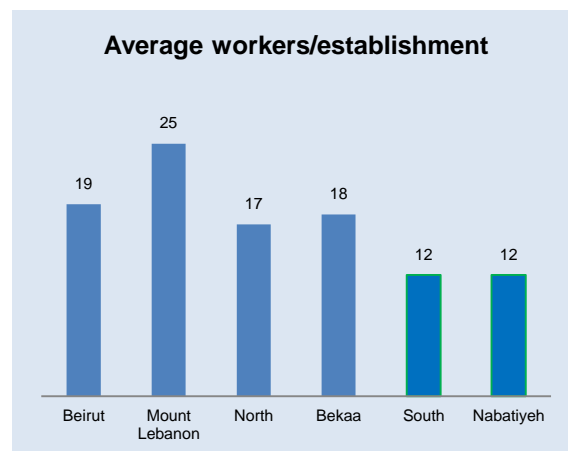
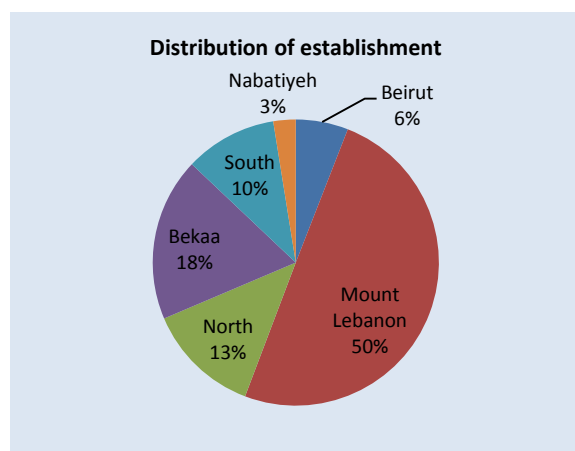
2.1 Sector Characteristics

According to survey results, Lebanon's industrial sector includes 4,033 establishments, with at least five employees. The mapping of the industries showed that the industrial units are not evenly distributed over the six Mohafazats.

¹ Based on the decree 5243/2001 (Industrial Classification) Class II and III industries are considered high to medium-risk facilities and class IV and V are classified as low risk facilities, have a minimum effect on the environment.

Table 1. Industrial Mapping

	Beirut	Mount Lebanon	North	Bekaa	South	Nabatieh	Total
No.of establishments	239	2,010	518	744	420	102	4,033
Average workers/establishment	19	25	17	18	12	12	21



Employment

The 4,033 industrial establishments employ a total of 82,843 workers of which:

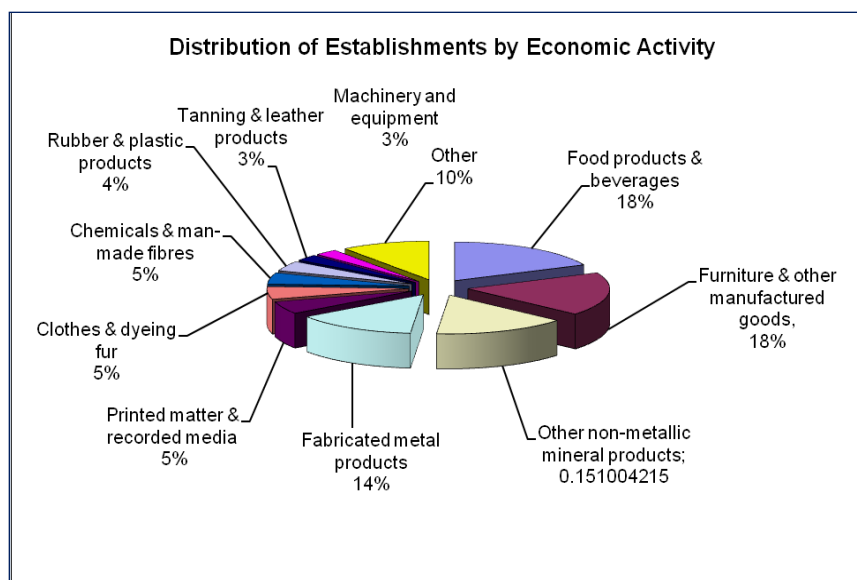
8,100 owners or partners
70,180 permanent employees
4,237 seasonal workers
326 outworkers

Only 17% of permanent employees are females.

The average number of workers by unit is 21.

The establishments employing from 5 to 19 workers represent 78.2% of the total number of establishments but only 33.6% of the total workforce

Figure 1 Ref MOI Survey 2009-2010



The Lebanese industrial sector is not very diversified, 86.2% of the industrial establishments operate in 10 major industrial sectors: Food products and beverages, Furniture and other manufactured goods, Other non-metallic mineral products, Fabricated metal products, Printed matter and recorded media, Chemicals and man-made fibres, Rubber and plastic products, Machinery and equipment, Electrical machinery and apparatus, Pulp, paper and paper products. These main industries generated 90.7% of the total value-added of the sector, employed 87.3% of the workforce and achieved 94.6% of the yearly industrial investments.

Figure 2 Ref MOI Survey 2009-2010

The total built operating area for the 4,033 industrial enterprises surveyed at the end of 2007 was estimated at around 11.6 million m², with an average built area per enterprise of 2,877 m². The workforce by built area is included in the table below.

Table 2. Workforce by Class

No. Workforce	Av. built area (m2)/establishment	Av. built area (m2)/worker
5 to 9	806	115
10 to 19	2,121	163
20-34	3,817	147
35-49	3,570	87
50-99	7,286	109
100-249	22,234	152
≥ 250	70,962	167

2.2 Quantitative Analysis

2007 Figures showed that the Lebanese industrial enterprises employing more than 4 workers produced a gross output of \$6.8 US billion. The output per worker was equal to \$82,087US. The food and beverage sector was the largest contributor (25.7%) to industrial output.

Total industry value added was \$2.1 US billion; ratio of value added to output was 30.4%.

*Total industrial output for the 4,033 industrial establishments reached USD 6.8 billion in 2007
Average output per enterprise: USD 1,686,162 compared to USD 542,326 in 1998
Output per worker: USD 82,087
Largest share in total output is Food and beverage: 25.7%
Other non-metallic mineral products : 11.7%
Metal products: 10.9%*

*Main components of the output
Sales from own production: 93.5%
Income from industrial and non-industrial services: less than 1%*

The lowest value was for coke products and refined petroleum products (4.9%). Highest value was for mining and quarrying (55.2%).

Average value-added per worker was equal to \$ 24,927 US. Highest value was for electrical machinery and the apparatus sector (USD \$61,786) compared to (\$11,749US) in the clothing sector and (\$26,987US) in the food and beverage industry.

Ratio of value added to output varied according to the size of enterprises. Enterprises employing more than 250 workers had the greatest contribution to total value-added (26.2%). This contribution was higher than their share of output (21.8%).

Table 3 Industry Consumption Vs. Value Added

	In (000) USD	In % of industrial output	In % value- added
Output	6,800,292	100%	
Value of goods produced	6,360,332	93.50%	
Services (industrial and non-industrial)	63,624	0.90%	
Intermediate Consumption	4,735,290	69.50%	
Net raw material	3,882,518	57.10%	
Electricity, energy products	382,808	5.60%	
Services and other operating costs	469,963	6.90%	
Value Added	2,065,002	30.40%	
Wages	548,203	8.10%	26.50%
Depreciation	299,642	4.40%	14.50%
Interest	158,169	2.30%	7.70%
Gross industrial margin	1,058,988	15.60%	51.30%

The total intermediate consumption was \$4.7 US billion out of which expenditures on raw materials and processed inputs represented 85.3%.

Table 4 Intermediate consumption breakdown

(Out of which)	USD 4.7 billion
Expenditures on raw materials and processed inputs	85.30%
Stock variation	-3.30%
Share of expenditure on petroleum products for own production of electricity	4.10%
Share of expenditure on electricity (from EDL)	1.30%
Share of expenditure on energy products for production	2.70%
Share of expenditure on maintenance	2.40%
Share of other expenditures	7.50%

Average salary of a permanent employee was \$7,492 US. Salaries varied by enterprise size. Average salary per employee is lowest in the small enterprises (5,895US) and highest in larger ones (\$9,494 US)

Salaries varied by region. The lowest average salary per employee was in Nabatieh (\$4,580US) and the highest is in Mount Lebanon (\$8,039US)

*On the 15th of October 2011, and after various unions, the minimal wage was increased by 40% (200,000 L.P- 133\$) to 700,000L.P (466\$) most unions went ahead with the strike except the general workers union .
Wages between minimal wage and 1,200,000L.P (800) were increased by 200,000 (133\$) to become 700,000L.P (minimal wage) and 1,400,000 (933\$) respectively.
Wages more than 1,200,000 L.P up to 1,700,000L.P (1133\$) were increased by 300,000L.P (200\$) to become 1,500,000L.P (1000\$) and 2,000,000L.P (1333\$).
Wages above 1,800,000L.P (1200\$) were not increased.*

Salaries are not homogeneous across economic activities. Salary per employee is lower than average in the food and beverage (\$6,959US), furniture (\$6,561US) and clothing (\$5,131US)

Salary per employee is higher than the average in the other non-metallic mineral products (\$7,876US), the printed matter and recorded media (\$8,722US) and electrical machinery and apparatus (\$8,220US)

2.3 Lebanon vs. South of Lebanon - comparative figures

South of Lebanon represents approximately 18% of Lebanon's territory and 17% of its population. The South has the highest ratio of micro and small enterprises and the least amount of medium and large enterprises. The total number of medium and large enterprises (more than 4 employees) is 522.

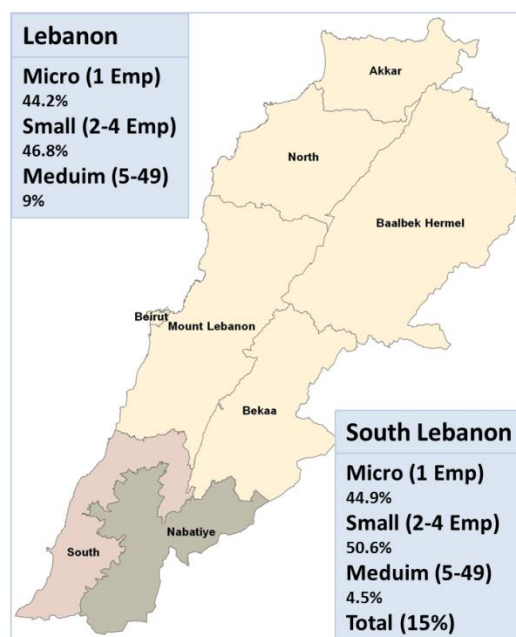
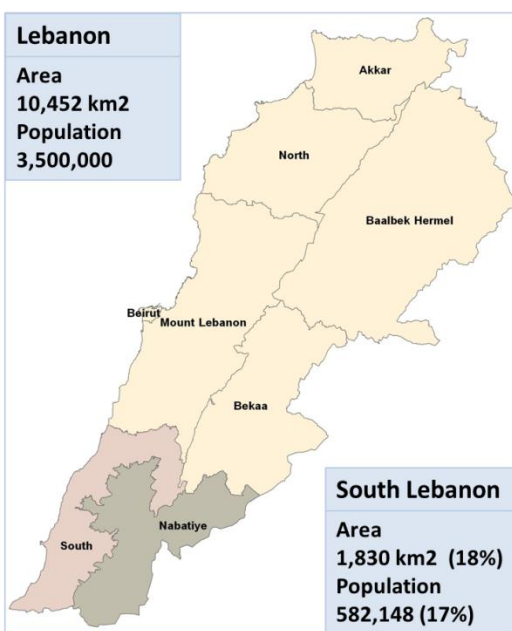
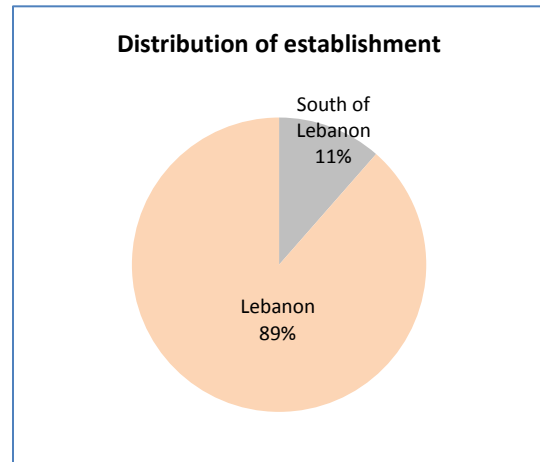
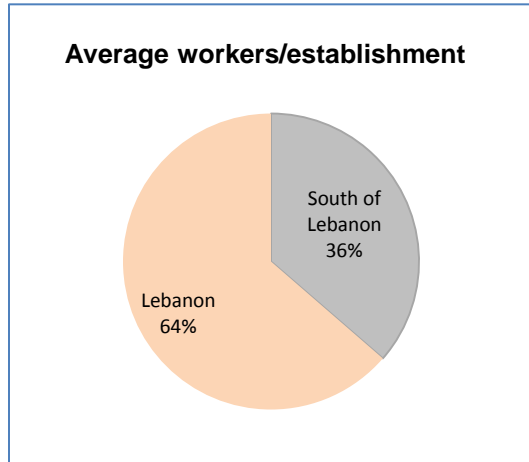


Table 5 Number of Establishment and average workers

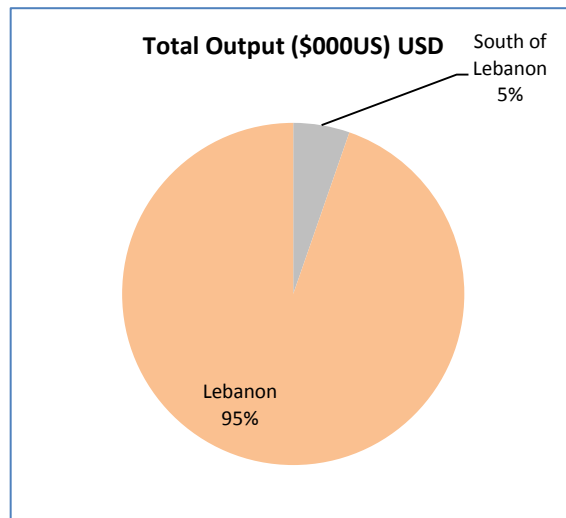
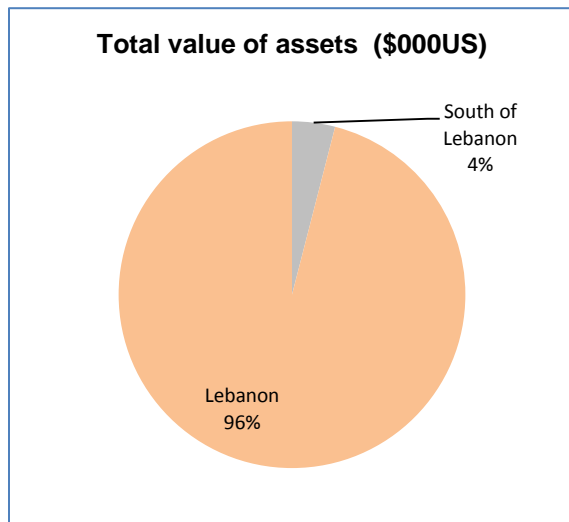
	South of Lebanon	Lebanon
Nb.of establishment	522	4,033
Average workers/establishment	12	21



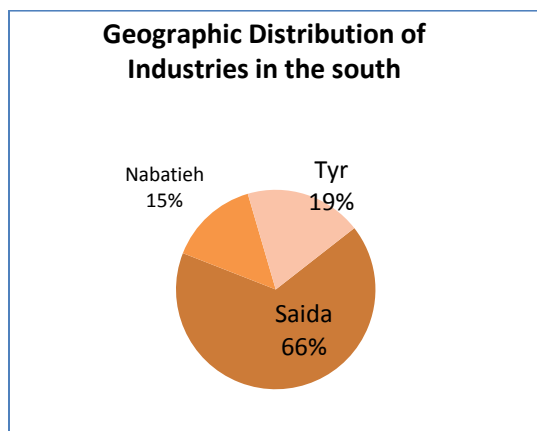
The share of land of industrial establishments in the south (3.6%) is lower than their share of output (5.7%). The same holds for their share of buildings (5.9%) in South). The table below shows the distribution of assets between the south of Lebanon and Lebanon.

Table 6 Distribution of Assets

	<i>South of Lebanon</i>	<i>Lebanon</i>	<i>Total Value assets (\$000US)</i>
Land	3.6%	100%	793,286
Building	5.9%	100%	973,298
Machinery	3.4%	100%	1,818,707
Vehicles	10.0%	100%	161,135
Computers	2.3%	100%	46,953
Environmental equipment	7.9%	100%	5,145
Other	1.2%	100%	200,196
Total value of assets (\$000US)	166,937		3,998,720
Total Output (\$000US)	382,487		6,800,292
Output (% of total)	5.7%	100%	



In 2009 CCIAS conducted a survey on all industrial activities regardless of the size of the enterprise. The survey covered Saida city, Tyr and Nabatieh including their suburbs. The three regions occupy a total of 1355 industries. The largest number of enterprises was Saida and its suburbs (66%), Tyr second with 19% of the total enterprises, and Nabatieh occupied the smallest share of 15 %.



Region	Total Industries
Saida	901
Nabatieh	197
Tyr	257
Total	1355

Figure 3 Ref CCIAS survey 2009

The top five industries in the South in descending order are Furniture and Wood Industry, Food Industry, Metal Industry, Tile and Stone Industry, and Machinery Industry. The largest industry in Nabatieh is the Food Industry. In Saida and Tyr the largest industry is the furniture and wood industries.

Table 7 Distribution by type of Industry

Industry	Nabatieh	Saida	Tyr
Furniture and Wood Industry	25	344	80
Food Industry	43	135	31
Metal Industry	29	109	31
Tile and Stone Industry	23	18	18
Machinery Industry	12	27	2
Textile Industry	6	18	10
Leather and Textile	0	10	1
Other Industries	59	240	84

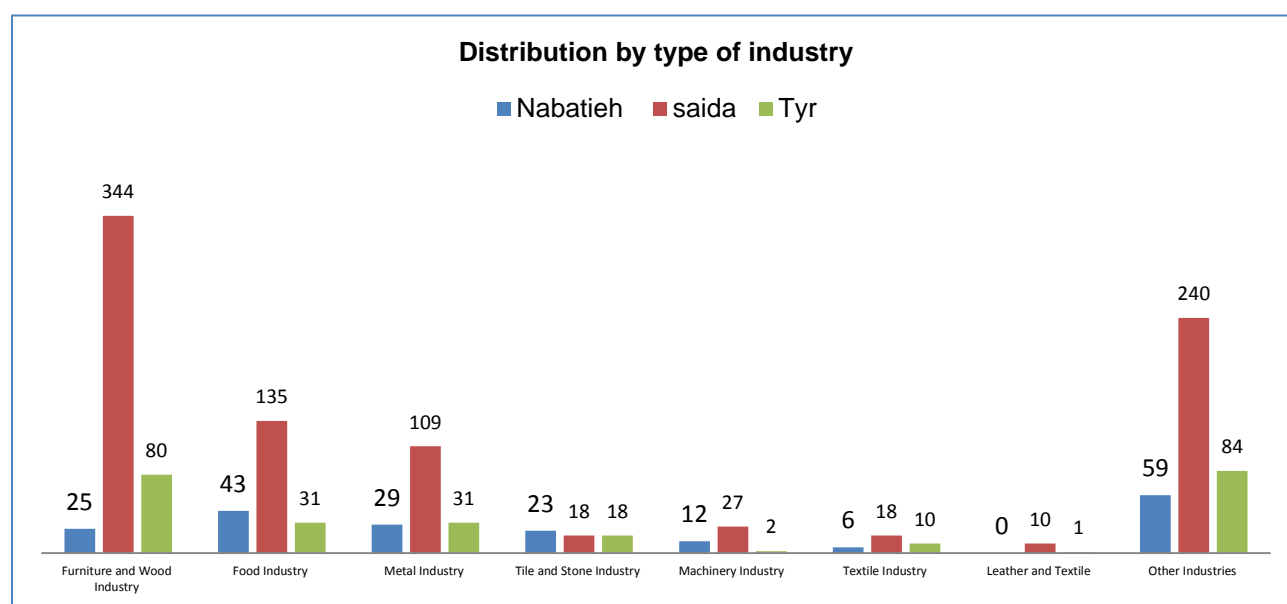


Figure 4 Ref CCIAS survey 2009

3 Current regulations

3.1 National Industrial Activity Classification

Until April 2001, classified establishments in Lebanon were subdivided into three classes (Decree 4917, 24/4/1994). Classified establishments include both industrial and non-industrial establishments. On April 5, 2001 the decree 5243 was issued and amended the classification of previous industrial establishments.

This latest classification system relied on several environmental criteria (e.g., impact on water, air and soil, environmental risk, odor, and noise) to define the degree of the environmental threat.

Class I industries are considered high-risk facilities. They include tanneries, cement, paper (from pulp), fertilizer, ammunition production plants and gas products.

Class II and III industries are considered high to medium-risk facilities and potentially pose significant risks to human health and the environment, because they are numerous (several thousands), scattered, and located often in residential areas.

Class IV and V are classified as low risk facilities, have a minimum effect on the environment, and can be located in close proximity to residential areas.

3.2 Industrial zones in Lebanon

A survey in 1999 conducted by the ministry of environment showed that there were 72 industrial zones in Lebanon, not all of them have been decreed, and none are adequately equipped to host industrial establishments (e.g., waste collection and treatment). Moreover, many industrial zones were established de facto and are more recently being decreed even though they were located close to residential areas or natural sites.

Industrial zones tend to be concentrated in and around Mount Lebanon. Several industrial zones remain relatively empty to this date, in particular due to increases in land prices, which have forced industrialists to locate their operations outside such zones.

In 1995, IDAL proposed a new strategy for industrial zones in Lebanon, which called for a more balanced geographic distribution, specific infrastructure, environmental and urban requirements, and financial incentives to encourage investments. In 1997 IDAL forwarded the file to the Ministry of Industry. However, implementing this strategy continues to face significant difficulties.

3.3 Industrial zones in the South of Lebanon

The same applies to the Southern Lebanon where the majority of industries are located outside of the industrial zones. Existing industrial zones are poorly equipped to collect and/or treat industrial waste. Such infrastructure is completely lacking outside industrial zones causing severe environmental pressures. Industrial units located within residential areas pose severe risks to public health and safety. Industries generate special wastes that impact water and soil quality and are a major source of air and noise pollution.

Many light industries are currently located in residential areas (e.g., basements, parking lots, warehouses). Examples include car mechanics, fruit fermentation chambers, woodcutting plants, glass craftwork, furniture manufacturing, print shops and olive mills. Residential areas also host many establishments such as water purification and bottling facilities.

However, there are four industrial zones in the south of Lebanon classified by specific decrees issued from the council of ministers. These zones are as follows:

- AL Insariyeh – Caza of Saida, Decree No. 6666 dd. 5/11/2001
- AL Bablieh – Caza of Saida, Decree No. 12859 dd. 8/8/1998

- Nabtieh Tahta – Caza of Nabatieh, Decree No. 10276 dd. 20/5/1997
- Tool – Caza of Nabtieh, Decree No. 6043 dd. 6/8/2001

3.4 Industrial Permit Process

The law 642 issued in 1997 gave the Ministry of Industry an overall jurisdiction over the permitting of industrial establishments. Permits for all classes must be applied at the departments of the ministry of industries at the Mohafazat level (designated as permitting units). Industries applying for class 3 to 5 are processed within the permitting units while class 1 and 2 are processed by the Ministry. It is also noted that all permits are issued by the Ministry of Industry and signed by the Minister.

The applicant must prepare the file on several copies to enable the permitting unit to forward the related document to the concerned authority to get their technical opinion on the file.

The chart of the process is included below.

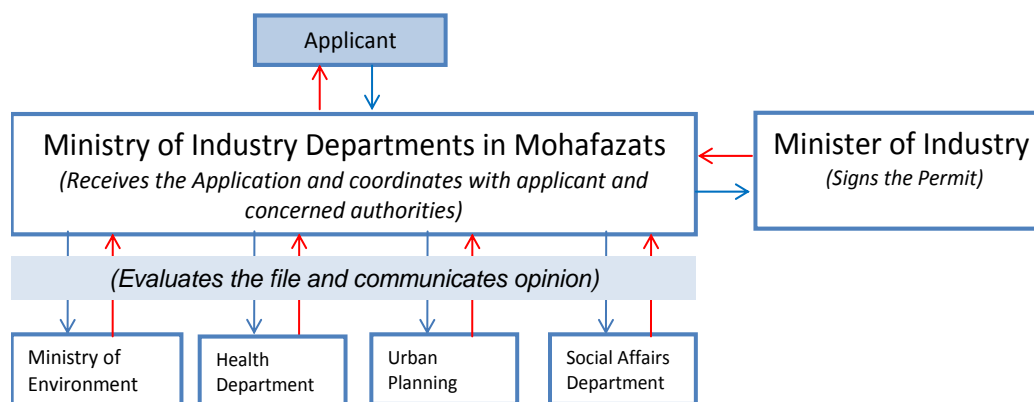


Figure 5 - Permit process

3.5 Industrial Zoning classification Process

3.5.1 The Principle of Zoning

The principle of zoning is to locate particular land uses where they are most appropriate, taking into consideration public utilities, road access, and the established development pattern. In addition to categorizing land by uses such as residential, commercial, and industrial, a zoning ordinance also specifies such details as building setback lines, the height and bulk of buildings, the size and location of open spaces, and the intensity to which the land may be developed. Zoning does not specify minimum construction standards; these are set forth in a separate building code.

3.5.2 The Requirement for Rezoning

When a property owner(s) wants to use land in a way that is not permitted by the applicable zoning, the owner must request to rezone the property to a classification which permits the desired use. A rezoning is a legislative action which is considered through a complex process.

The request of rezoning must be justified in one of the following three circumstances:

- Rezoning is requested by one of the concerned authorities (Concerned Municipality or Director General of Urban Planning (DGU) or Ministry of Industry). The objective of rezoning would be to ameliorate the overall master plan of the region.
- Changes have occurred to conditions in the vicinity of the property which prevent the reasonable use of the property as it is currently zoned.
- When there was an error or oversight in the original zoning of the property.

3.5.3 *Applying for Rezoning*

The process begins by submitting an application to the Ministry of Industry. The file must comprise at least:

- The map and parcel number of the property as listed with the Property Registry.
- The existing zoning classification and the requested zoning change (plans and narrative justification).
- The existing land use and proposed use for the property (Plans and narrative justification).

The Ministry will study the request and forward the file to the concerned authorities to get their opinion (DGU, Ministry of Environment, and Concerned Municipality).

Once feedbacks are gathered, the file will be compiled and presented to the Minister of Industry that will review, assess the reports, endorse the recommendations and forward the file to the council of ministers for their review and take accordingly the appropriate resolution.

Based on the council of Ministers approval, the Ministry of Industry drafts the relevant decree that will be signed by the Minister of Industry, Minister of public works and the Prime Minister.

The rezoning will be effective after it is published in the official Gazette.

4 Identification of suitable industrial sectors to be hosted in the industrial park

Based on the working group consultation, industrial activities were selected, identified and initial zoning categorization was concluded enabling the accommodation of light industrial, medium industrial and back office activities of the designated activities.

The selection of industrial establishments was based on the International Standard Industrial Classification (ISIC) code, adopted by the Ministry of Industry in 2001.

Table 8 Activities to be hosted in the proposed Industrial land

ISIC Code	Economic Activity	Category				
		I	II	III	IV	V
14	Mining & quarrying products		X	X	X	
15	Food products & beverages		X	X	X	X
16	Tobacco					
17	Textiles			X	X	X
18	Clothes & dyeing fur			X	X	X
19	Leather & leather products			X	X	X
20	Wood products (except furniture)			X	X	
21	Pulp paper & paper products			X	X	X
22	Printed matter & recorded media		X	X	X	X
23	Coke & refined petroleum products					
24	Chemicals & man-made fibers				X	X
25	Rubber & plastic products		X	X		
26	Other non-metallic mineral products			X	X	
27	Basic metals		X	X	X	
28	Fabricated metal products		X	X	X	
29	Machinery and equipment		X	X	X	
30	Office, accounting and computing machinery				X	X
31	Electrical machinery and apparatus		X	X	X	X
32	Audio visuals			X	X	
33	Medical, precision and optical				X	
34	Motor vehicles, trailers and semi-trailers			X	X	
35	Transport			X		
36	Furniture & other manufactured goods			X	X	X
37	Recycling			X	X	
38	N/A in Lebanon					
39	N/A in Lebanon					
40	Electricity, gas, steam and hot water supply					
41	Collection, purification and distribution of water				X	

5 Land Selection

The identification of individual sites suitable for Industrial Park development was carried out using a three step process.

Step 1. From a first screening of four candidate sites identified by key stakeholders, two sites chosen for discussion. The first site was disregarded because it was too small (less than 200,000m²) and the second was purely agricultural and all planted with citrus fruits.

Step 2. An initial screening of the 2 sites was carried out using the below checklist completed by the working group.

Site area, Suitable site topography, General environmental condition of site, Clear land tenure, Proximity to functioning port, airport and road network, Access to power, water, telecoms, labor, Access to labor, Facilitates the development of multiple economic activities.

Criterion	Site 1 grade (1 to 5)	Site 2 grade (1 to 5)
Site area	5	4
Suitable site topography	4	3
General environmental condition of site	4	2
Clear land tenure	5	5
Proximity to functioning port, airport and road network	4	5
Access to power, water, telecoms	4	3
Access to labor	4	3
Facilitates the development of multiple economic activities.	5	3
Total (over 40)	35	28

Step 3. The two sites were subjected to a more detailed site analysis elaborated in Section B.

Their location is shown below



Figure 6 Site 1

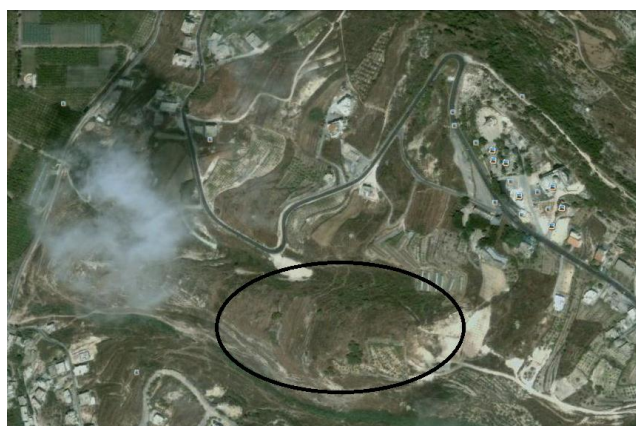


Figure 7 Site 2

Section B

Rapid Environmental Impact Assessment

1. Introduction

This section presents the Rapid Environmental Impact Assessment (REIA) for the development of the proposed industrial land and briefly describes the areas to be affected or created by the zoning under consideration.

2. REIA objective

The REIA is prepared to provide a preliminary assessment and screening of the potential environmental impacts of the proposed Industrial land before a final decision is taken.

3. Policy, Legal and Administrative Framework

An overview of the current Lebanese Legislation relevant to the development of industrial park was conducted with identification of decree/resolutions of potential relevance such as the Decree No. 2366/2009 (Schema D'Amenagement du Territoire Libanais "SDATL")

Similarly several international conventions endorsed by Lebanon in relation to the environment in general were identified with their relevance to the proposed project (i.e. Barcelona Convention and Montreal protocol, and other).

Various institutions that are closely involved in the proposed project include the Ministry of Industry, Ministry of Public Works and Transport (MoPW) through the Directorate General of Urban Planning (DGU), the Ministry of Environment (MoE) and Municipality of Marwaniyeh.

Decree No. 2366/2009 (SDATL) issued with the consent of the Council for Development and Reconstruction (CDR) and the Supreme Council for Urban Planning. The Decree considers the Comprehensive Plan for Lebanese Territory Arrangement as the general guiding framework of urban planning and land use, and therefore ministries, departments, public institutions, municipalities and Lebanese unions shall adopt all directives and guidelines compatible and agree with this Plan. The decree deals with provisions related to the urban planning, and classified the Lebanese territories into:

U: urban

R: rural

A: agricultural

N: natural resources and cedar mountain chain forests and valleys

S: Archaeological sites

F: areas prone to flooding

G: landslide areas

4. Land Description

The proposed site spans over an area of around 750,000m² in Marwaniyeh – South of Lebanon. It is an almost empty plot of land except of a small old hospital for mental illnesses people. hosts around 10 ill people. The site is easily accessible from the national highway Nabatiyeh-Zahrani. The proposed site is defined at its West, East and South by a storm water separates it from adjacent lots, whereas part of its the northern side the Zahrani-Nabatiyeh highway.

The land falls in sector "R" according to the decree No. 2366/2009 whereas there is a high possibility to be undertaken as industrial land by the concerned authorities considering that there is no major natural resources or archaeological matters.

5. Methodology used

13 potential environmental factors were identified and relevant indicators were listed for each factor. The proposed industrial land has been assessed against each factor, scoring them on a scale of 1 to 10 as follows:

- Scale Score 1 to 3 - Negative Environmental Impact
1 = significant adverse environmental impact
2 or 3 = negative adverse environmental impact
- Scale Score 4 to 7: Neutral Environmental Impact
- Scale Score 8 to 10: Positive Environmental Impact
8 = good positive environmental impact
9 = very good positive environmental impact
10 = excellent positive environmental impact

6. Rapid Impact Assessment

Environmental impacts are expected during both construction and operational phases. The associated impacts during the construction phase are particularly on air quality and noise while in the operation phase. Limited negative impacts are associated with the proposed project in comparison with significant potential positive socio-economic returns.

The negative impacts can be reasonably controlled by adopting proper management and planning procedures. Mitigation measures should be employed as part of the project requirements.

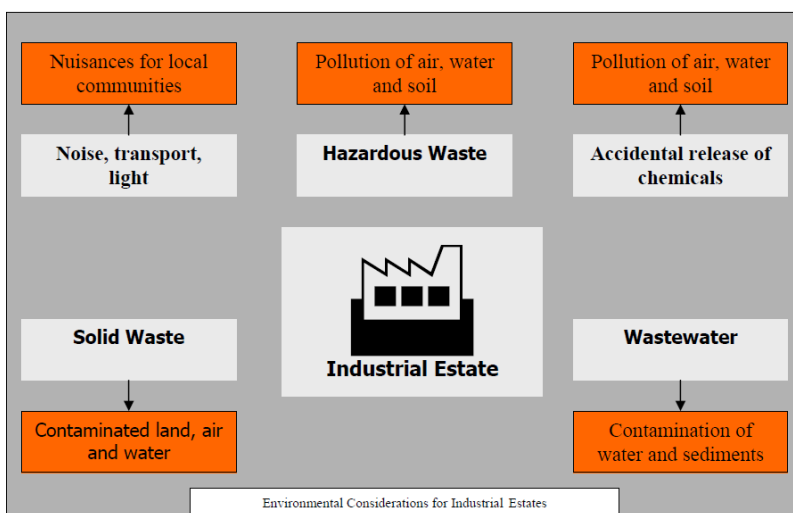


Figure 8 Environmental Considerations Related to Industrial Estates (ref: *Industrial Estate Guidance Manual resulting from the SMAP 006 SYR*)

The following subsections 6.1 to 6.13 list all of the 13 environmental factors scored (1-10) and include relevant comments related to the measures consistent with the development of the industrial land.

6.1. Air Pollution

Description: A substance in the air that can cause harm to humans and the environment. Major pollutants caused by human activity include CO₂, carbon monoxide, sulphur dioxide, nitrogen dioxide, mostly related to burning different types of fuel.

Air Pollution Factors	Score	Comments
significant air pollutant emissions	3	According to industry type, the levels of air emissions can vary considerably contributing in certain cases to different environmental concerns. It is recommended to create a bumper zone between these industries that mostly classified 2&3 from the light industries that are classified 4&5. In operation phase it is mandatory to impose installation of adequate filtering systems for stack emissions for industries that generate such emissions.
direct and indirect primary PM10	7	Accidental
direct and indirect NOx	4	Encouraging the use of low NOx burners
a deterioration of existing air quality	4	Encouraging the use of vapor recovery systems, where feasible
objectionable odors	4	Locate industries in the zone 4&5. Mandatory installation of adequate filtering systems
alteration of air movement	7	Neutral effect
alteration of temperature	7	Neutral effect
increased use of (e.g. diesel) fuel	3	Centralized Generator set to supply all operations. Advised location on the highest point of the land.
tree planting scheme	9	Encourage plantation

6.2. Waste

Description: Items that people or organizations no longer have a use for; or that they are required to discard because it is hazardous.

Waste Factors	Score	Comments
Is the proposal likely to generate waste?	3	Encourage industries to Recycle, Reuse and pre- treat the waste.
Have steps been taken to ensure that any waste produced is not disposed of illegally?	8	Creating a sound waste collection and disposal system in addition to creating a centralized recycling and/or composting center

6.3. Water Pollution

Description: Any chemical, physical, biological change in the quality of water that has a harmful effect on any living thing that drinks it, uses it, or lives in it. It is usually caused by human activities by discharging pollutants at specific locations through pipelines or sewers into surface water.

Water Pollution Factors	Score	Comments
Sewage disposal	8	Designing a dual systems of pipes which can separate human wastes from graywater. Designing onsite wastewater treatment

		plants to reduce or eliminate additional flows generated by the development project to the sewer system
Pesticides	4	Imposing when necessary (food Industries) a mandatory installation of wastewater pre-treatment/control measures before sending wastewater streams to treatment plants
Fertilizers	4	Imposing when necessary (food Industries) a mandatory installation of wastewater pre-treatment/control measures before sending wastewater streams to treatment plants
Oil / Petroleum	4	To be controlled tightly
Metals and Solvents	3	Imposing the use of mandatory pre-treatment for specific industries mainly located in zone classified 2&3

6.4. Noise and Vibration

Description: The degree to which noise interferes with the peaceful pursuit of normal activities, the degree to which it may impair health. Vibration causing disturbance, annoyance, inability to concentrate; sources include roads, railways, construction activities. Can cause damage to buildings, sensitive machinery and equipment.

Noise/Vibration Factors	Score	Comments
Create disturbance or an adverse impact caused by vibration?	8	Neutral effect
Create disturbance or an adverse impact caused by noise	4	Designing special areas for the operation of heavy machinery, generators whenever possible (bumper Zone) Designing special walls that would attenuate the noise pollution levels Providing natural shielding to reduce noise pollution levels

6.5. Amenity

Description: How will the proposal impact on the visual environment

Amenity Factors	Score	Comments
Will the proposal result in a noticeable (adverse) change in the physical characteristics of the existing environment?	5	Executing an appropriate road network, Landscaping and setting a unified architectural codes
Will the project complement or contrast with the visual character desired by the community?	9	Project is encouraged Selecting building design and colors to establish continuity and compatibility within the neighborhood by the community.
Will any change to the visual environment be mitigated by normal means such as landscaping and architectural enhancement?	9	Preserving as many existing trees and green areas as possible

Will avoidance measures be necessary to minimize adverse change?	9	Planting one tree every 10 meters along the front property landscape buffer strip, and exterior side yard buffer strip. Spacing of the trees should frame the front of the building and screen parking areas Insuring that at least 5% of the interior parking areas are landscaped
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6.6. Water Conservation

Description: The usage and recycling of water. Measures include the use of water saving technology.

6.6. Water Conservation Factors	Score	Comments
Has a water conservation assessment been carried out?	8	Considering onsite storm water management such as tanks or ponds for capture of storm water from roofs especially in dry regions Instituting segregation of storm water from process water
Are water conservation measures appropriate?	9	To conserve water quantity and quality, designers will need to find alternatives such as greater use of permeable surfaces for parking, smaller footprint for buildings, narrower road widths

6.7. Energy

Description: The scientific consensus is that our current levels of man-made carbon dioxide (CO₂) and other gaseous emissions are leading to global warming. These emissions are mainly caused through the use, supply and generation of energy. Unchecked and reversed these rises in temperature will lead to uncontrollable climate change and severe consequences for life on earth.

Energy Use Factors	Score	Comments
How will this proposal affect energy consumption?	2	High consumption.
Has the proposal been assessed against the Authority's Carbon Reduction Plan?	2	No
Will the proposal contribute to achieving the Council's Carbon Reduction Plan?	5	Currently N/A in Lebanon The management will coordinate with the MoE in implementing a reduction Plan.

6.8. Energy Efficiency

Description: Efficient energy use is using less energy to produce the same level of energy service. It is primarily achieved by using more efficient technology or processes, rather than by changing individual behavior.

Energy Efficiency Factors	Score	Comments
Insulation	6	Promote the usage of the appropriate building Material (double walls, double

		glazing, etc.)
Skylights	6	Encourage the use of skylights when applicable
Energy efficient appliances	6	Optimizing energy usage through cascading (i.e. the use of residual heat in liquids or steam from a primary process to provide heating or cooling to a later process) Optimizing usage of energy efficient equipment/installations (i.e. sensor equipped lighting systems, energy saving bulbs, etc.)
Renewable energy sources	6	Optimizing renewable energy usage in non-essential applications (i.e. solar panels for water heating, mini hydros for power generation, etc.)
Building design	6	Promote green buildings

6.9. Access to quality green space

Description: Green space is accessible green places we can visit and enjoy that provide opportunities for recreation, relaxation, social interaction.

Recreational Factors	Score	Comments
Will the proposal affect / reduce / increase access to green space?	8	The current site is not accessible.
Will the proposal affect opportunities for recreational activity	9	The development will envisage green areas and parks

6.10. Flooding

Description: Flooding is caused by rising ground water levels, burst water drains, hillside 'run off' from sudden rain, and flooding from rivers or the sea

Flooding Factors	Score	Comments
Will the proposal increase the risk of flooding?	8	According to the decree 2366/2009 the site is not classified in flood areas
Will the proposal reduce the risk of flooding?	8	Neutral effect

6.11. Transport

Description: Transport is a major source of air pollution, and noise

Transport Factors	Score	Comments
Affect the present patterns of movement of people e.g. greater car use; impact on existing transportation systems, including roads, transit, facilities?	8	The site is located next to the National Highway (Zahrani – Nabaityeh).
Increase traffic hazards to pedestrians, cyclists, or motorists?	9	The site is distant from any residential area
Increase congestion?	8	The site is located next to the National Highway (Zahrani – Nabaityeh). Has a

		dedicated entrance and exist.
Lead to changes to existing parking facilities, or the demand for new parking facilities?	8	No effect

6.12. *Biodiversity*

Description: This can be described as the variety of life in a particular habitat.

Biodiversity Factors	Score	Comments
How will the proposal affect biodiversity?	7	No affect. As no existence of significant Flora or Fauna in the area.
- Directly	7	No affect.
- Indirectly	7	No affect.
- Cumulatively	7	No affect.
Will the proposal enhance / maintain biodiversity?	7	Neutral

6.13. *Resource reduction/reusable*

Description: The use of resources for the construction and the operational requirements of any proposal or activity.

Resource Factors	Score	Comments
Are the materials sourced from a sustainable source?	3	Except for the agrofood industries most of the materials are not sourced from a sustainable source
Is the project utilizing local suppliers and contractors?	9	Will be contracted from the area
Is the project maximizing the use of recycled products?	8	The project will promote the use of recycled products

7. Conclusion

The REIA revealed that the proposed land rezoning will have a positive socio-economic impact at the local and national levels.

Social benefits are resulting from protecting property values, reducing health hazards, attaining a more balanced distribution of production and employment by spreading out industrial districts to rural areas and maximizing land use efficiency

However, its implementation is associated with a variety of environmental impacts that should be controlled by adopting adequate mitigation measures, all while ensuring proper environmental monitoring during both the construction and operation phases couples with institutional strengthening and capacity building.

Below is a summary sheet of the assessment:

Factor	Positive Impacts	Neutral Impacts	Negative Impacts
Air pollution		Score= 5.33 (Neutral)	
Waste		Score= 5.50 (Neutral)	
Water pollution		Score= 4.60 (Neutral)	
Noise/Vibration		Score= 6.00 (Neutral)	
Amenity	Score= 8.00 (Good)		
Water conservation	Score= 8.50 (Good)		
Energy		Score= 3.00 (Neutral)	
Energy efficiency		Score= 6.00 (Neutral)	
Access to quality green space	Score= 8.50 (Good)		
Flooding	Score= 8.00 (Good)		
Transport	Score= 8.25 (Good)		
Biodiversity		Score= 7.00 (Neutral)	
Resource reduction/reusable		Score= 6.60 (Neutral)	

Section C

Preliminary land-use layout plan by type of industry and associated estimates cost of the general infrastructure development

1. Industrial Park Definition

A well-defined land with technical and production infrastructure, where economic activities are being carried out, mainly industrial production, service provision, under a specific facilities regime, for the purpose of capitalizing human and material potential of the respective region.

M.T. Peddle defines industrial parks as *“A large tract of land, sub-divided and developed for the use of several firms simultaneously, distinguished by its shareable infrastructure and close proximity of firms.”*

2. Proposed Industrial Park Objectives

The objectives for establishing an industrial park in the South of Lebanon are:

- To secure appropriate area for industrial plants and related activities already operating in non-classified area with poor infrastructure;
- To promote opportunities for certain types of industrial plants to concentrate on mutually beneficial relationships to each other;
- To construct and preserve an attractive industrial zoning with substantial amounts of landscaping and cautious consideration towards architecture and appearance from the freeway;
- Achieve financial benefits to the developers/investors

The location and design of the proposed industrial land has taken into consideration environmental issues which was one of the main factors for determining the most efficient operation while controlling environmental degradation and pollution.

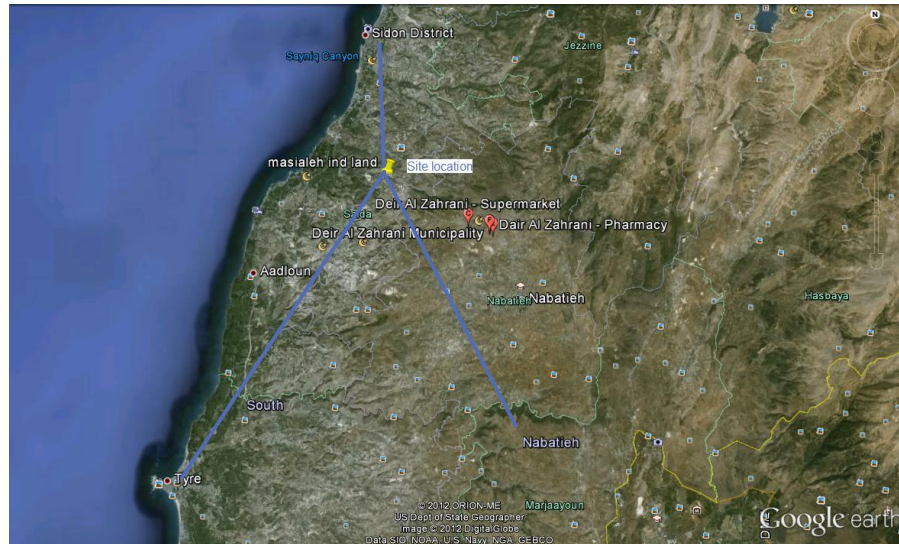
3. Legal Issues

The design and operation plan for the proposed industrial land was developed taking into consideration existing legal regulations for the area. The commercial register of the land showed that it is situated in an unclassified area. The land at the intended location of Marwaniyeh according to the Decree No. 2366/2009 (SDATL) it is designated as rural thus the probability of granting the rezoning is most likely to be approved.

4. Location Characteristics

The land is constituted of several plots, the total area is around 750,000m² near the Zahrani-Nabatiyeh national highway, at 5 km from the Zahrani interchange. This location is 45 km from Beirut airport and 14 km from Saida sea port.

The main advantage benefiting the location for the Marwaniyeh Land is that it has a direct connection with the national highway and is situated in the middle of the south and relatively close to the three main southern cities. (26 Km from Tyr, 24 km from Nabatiyeh and 14 km from Saida)



5. Land-use layout

Based on the conditions offered by the location of the land the proposed activity areas for the industrial land are as listed in Table 8 “Activities to be hosted in the proposed Industrial land”, and in the aim to maximize environmental performance and financial savings most of the recommended environmental introductions highlighted in section B have been taken into consideration in the preparing the land use layout in addition to the appropriate engineering requirements.

The design has covered the following issues:

- Locating highly polluting facilities in the center of the industrial land to cater for industries classified 2 and 4
- Locating a buffer zone to host industries classified 4 and 5 to be as a transition area between the heavy industries and the surrounding plots
- Promoting site implementation on suitable land conditions (i.e. gently sloping ground for drainage, good ground conditions for building foundations)
- Promoting square or rectangular shaped sites as these could offer the greatest flexibility and user satisfaction
- Allowing storm run-off to percolate through the soil or be directed gently into wetlands where plants remove many nutrients and pollutants
- Designing a suitable internal road Network and relevant utilities and treatment plants as recommended

The current plots distributions and size are poorly designed (see fig 9), the proposed master plan takes into account the above mentioned issues. The suggested plot allocation and zoning are shown in figures 10, 11 and 12.

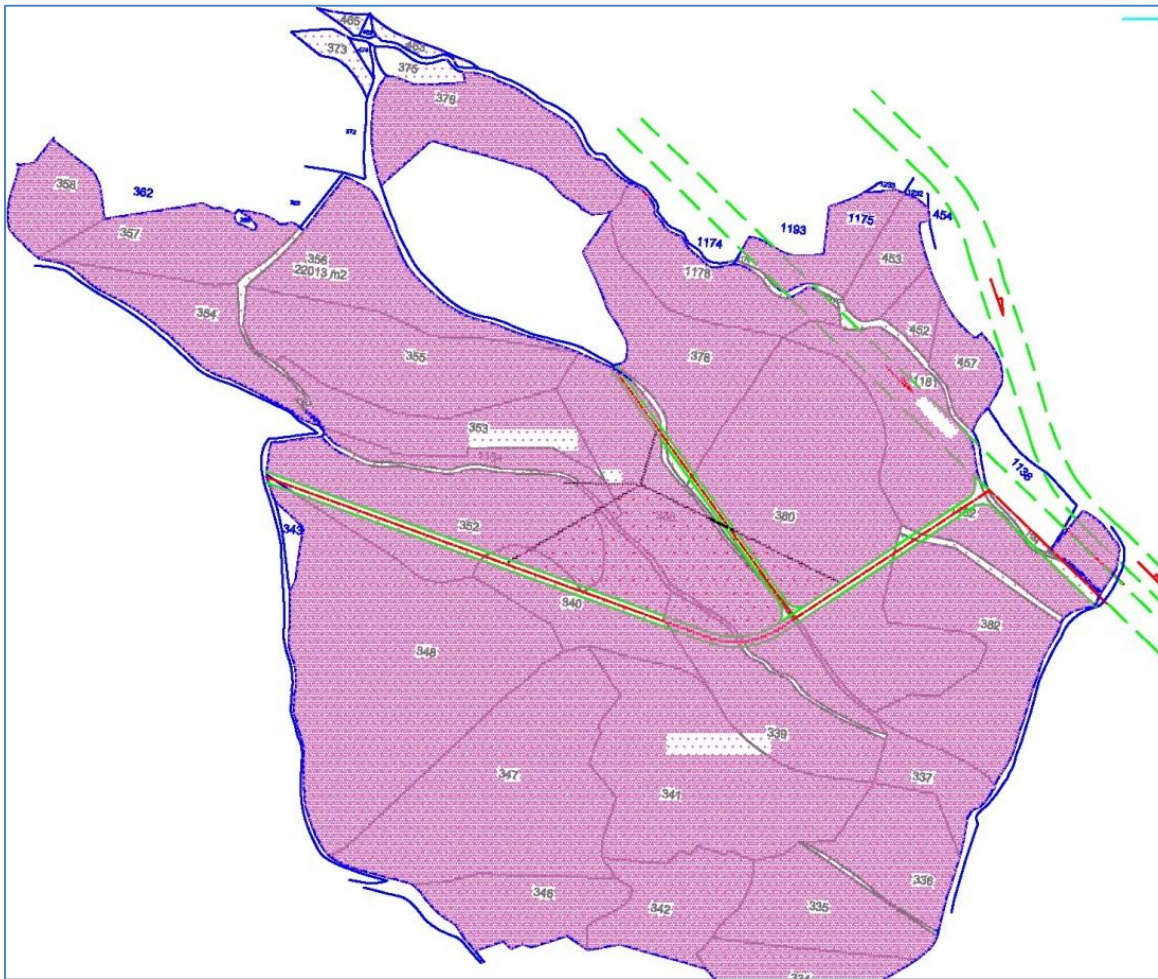


Figure 9 Present plots distribution

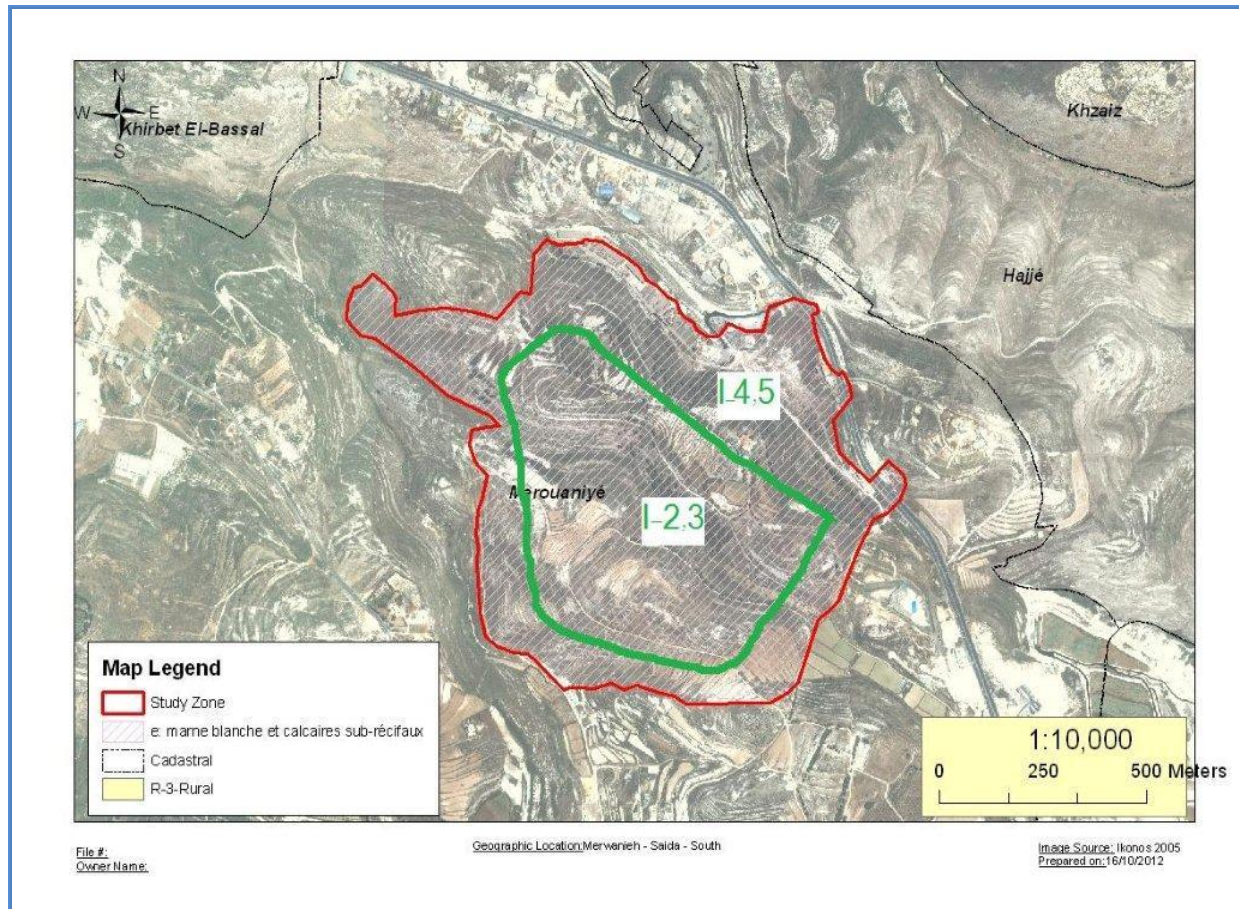


Figure 10 Land projected on Google earth (it shows as well the intended zoning/classification (I – 2,3 Industries classified 2 and 3. I – 4,5 Industries classified 4 and 5)

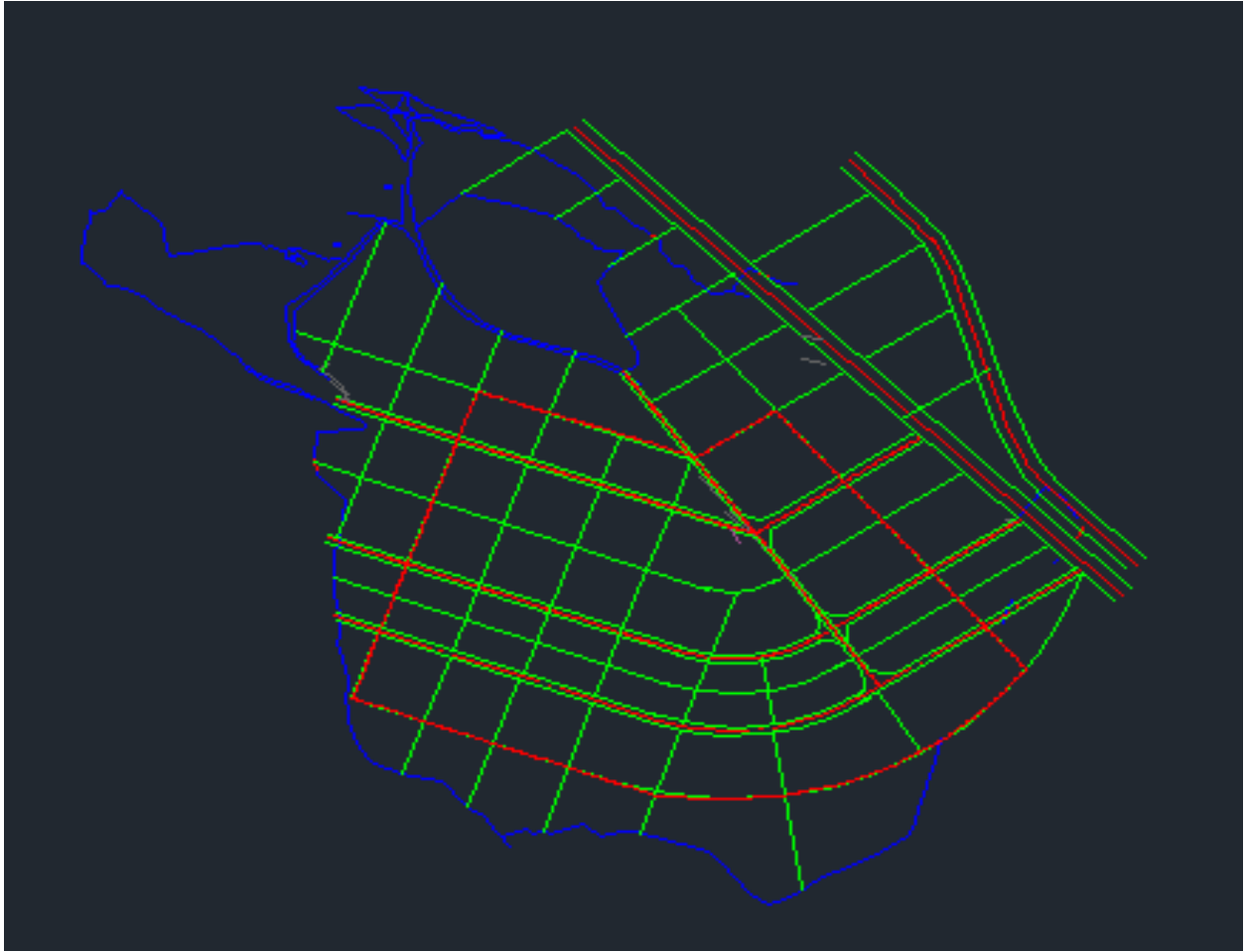


Figure 11 Proposed subdivisions

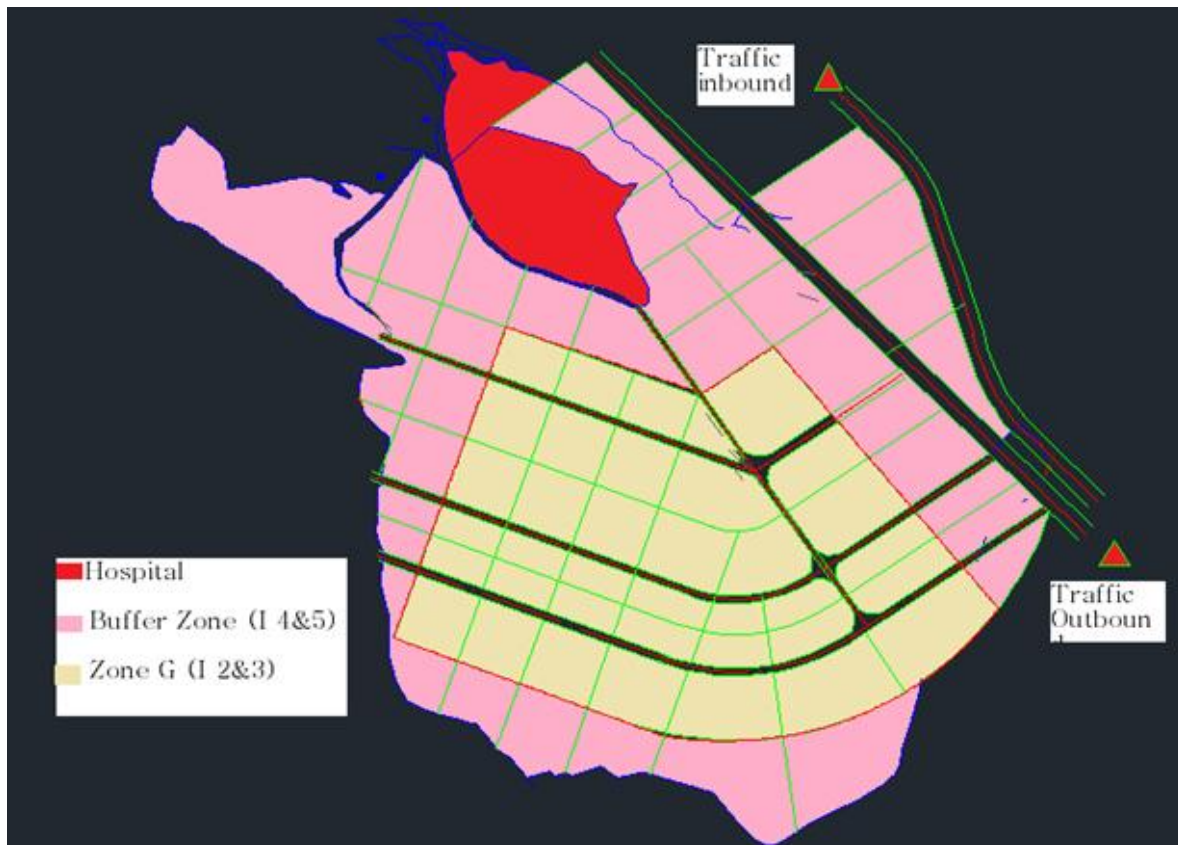


Figure 12 Proposed subdivisions with zoning

6. Internal Infrastructure

All the industrial lots in the industrial land will be served with infrastructures complete with supplies of treated water, electricity and telecommunication services. It will be well-laid with roads, drains and street lights as well as built with exhibition lots. The development will be designed to cater for local and foreign establishments willing to establish, expand and grow their business in south of Lebanon.

The total infrastructure costs were estimated to be around \$14M to cover the execution of the following listed works.

6.1. Internal road

For the rational use of Marwaniyeh land, because the width is relatively equal to the length the road has been designed to serve the subdivisions from east to west and from North to the south connecting these roads to the national highway. The total length of the internal roads is around 4.5 km with an average width of 12m.

6.2. Internal utilities networks

The internal network water pipes, and cables for electricity supply and phone service will be built within the land alongside its western side, at least 2 m from the fence.

6.3. Electricity supply

The electricity and telephone supply networks are required to be built by assembling them in some underground. It is envisaged to procure one centralized set of generator set to serve the industrialists.

6.4. Water pipes

The length of the internal pipes for the drinking water supply will be of 3.5 km. Taking into consideration the nature of the industrial land, it is necessary to have a polyethylene pipe of an appropriate diameter to meet the needs.

6.5. Sewerage network

The length of the internal sewerage pipe of public utility will be 3.5 Km. According to the standard data, polyethylene pipes must be used and diameter must be calculated according to the estimated volume of discharged water. It is also necessary to install a facility for the biological treatment of the wastewater dimension must be calculated based on the consumption.

The internal sewerage pipe will be built alongside the eastern side of the land, one meter from the fence.

The wells of the sewerage network will be installed at a distance of 40 m from one another. Branches of 10 m towards the adjacent land plots shall be built in the sewerage wells from the main pipe.

6.6. Pluvial Water

Flows accumulated from the asphalted territories and the roofs of the building located on the industrial must be evacuated. The configuration of the land area and the adjacency of make it easy to evacuate the water into the storm water.

6.7. Wastes Treatment

Appropriate and shared solid waste disposal and treatment facilities will be executed in addition to appropriate and shared wastewater treatment plants.

6.8. Landscaping

Well planned and executed landscapes to provide, comfortable environment for work and living.

Section D

Economic Analysis

I. Introduction / Background

Recognizing the need for governmental support for the industrial sector in the south of Lebanon and the need for improved infrastructure, the Chamber of Commerce Industry and Agriculture of Saida and South (CCIAS) has identified land, is searching for investors, and is currently working with government stakeholders to change a regulation to rezone a plot of land solely for industrial activities. The hope is that with this new industrial zone in place, investors will be willing to take on the risk of investing in infrastructure to better serve industrial firms, while relieving some of the burden on the regional and local environment. In this context, the Working Group conducted an economic analysis to assess the potential impacts of the new land regulation.

II. Stakeholders

- a. Industrial Sector - All actors from upstream to downstream (Input suppliers, banks, logistics, industrialists, local distributors, local retailers, international distributors, international retailers.

Interested in helping to promote output while reducing the environmental footprint of the industrial base CCIAS conducted a survey in 2009, focusing on approximately 1350 industries in Saida city, Tyr, Nabatiyeh, and their suburbs. Data from this was collected and is presented in sections 1 and 2 of this report.

With a successful regulatory change and investment, over a 20 year time frame, as many as 240 industrial enterprises are projected to open operations in the industrial zone. Of this 240 approximately 50% (120) will be relocating their operations from other facilities around Lebanon. Of this 120, approximately 70% of the enterprises are registered and approximately 25% are currently paying taxes. Once these establishments are relocated to the Industrial park all will be legally registered and paying corporate taxes. The remaining 50% are anticipated to be new enterprises that are not currently operating in Lebanon and will also be registered and paying corporate income taxes.

- b. Public

The public in Southern Lebanon and other parts of Lebanon are expected to be impacted by this investment as follows:

- Employment is projected to increase proportionately with the number of new and relocated enterprises, thus reducing unemployment, disposable personal income and improving living standards across Lebanon. Based on the survey, every new

enterprise is projected to represent approximately 12 new employment opportunities.

- The public also stands to benefit from the health safety factors that accompany any regional reductions in industrial effluents, solid waste and potentially toxic air emissions. In the long-term this is projected to make the public in Southern Lebanon more productive, reduce health care spending and thus increase disposable personal income and living standards across Lebanon.

c. Local Municipalities and the Lebanese Government

As an example of the public sector concern and interest around this topic, in the years 2009 to 2010, the Ministry of Industry initiated in cooperation with Association of the Lebanese Industrialists (ALI) and with the technical assistance of United Nations Industrial Development Organization (UNIDO), a survey directed at all establishments employing five or more employees. The aim of the survey was to map the industries, define the profile of industrial establishments and evaluate their activities and financial performance. This survey provided the Working Group with extensive data on sector count, mapping of industries and classification of industries, value-added statistics by industry sector, employment by industry sector, regional wages by industry sector, and private/fixed investment data by industry sector.

Without having to provide any financial support for this investment, the government is projected to benefit significantly from increases in direct, indirect and induced output and employment in Lebanon through increases to corporate and personal income tax revenues.

In addition, like the general public, the government also stands to benefit from the health safety factors that accompany any regional reductions in industrial effluents, solid waste and potentially toxic air emissions. In the long-term this is projected to make the public in Southern Lebanon more productive, reduce health care spending (40% of which is currently being subsidized by the Lebanese government)² and thus increase regional output, disposable personal income and consumption, while increasing corporate and personal income tax revenues.

d. Investors

The current expectation is that this investment will have to fully funded by private investors with no financial assistance provided by either local Municipalities or the Lebanese Government

III. Economic Analysis

a. Output

² World Bank Databank – Lebanon - <http://data.worldbank.org/country/lebanon>

Over a 20 year time frame, as many as 240 private enterprises are projected to be operating in the industrial zone. Of these enterprises, approximately 50% (120) will be relocating their operations from other facilities around Lebanon. The remaining 50% (120) are anticipated to be new private enterprises that are not currently operating in Lebanon.

In addition to the direct output that is being created, these industries will be reliant on intermediate inputs in their production process, thus creating additional demand for goods and services around Lebanon. In order to calculate the indirect and induced impact of increased demand for intermediate inputs, a multiplier was calculated for increases in output revenue to the region using USAID's version of the Oxford Economic (OE) Lebanon model³. The estimated regional multiplier on direct output for Lebanon over a 10 year time span is approximately 1.49 (Table 1). Put another way, for every new enterprise that will open their operations in the industrial zone, within 10 years the Country of Lebanon can expect to see an additional 0.49 indirect and induced enterprises created as a result.

Table 9: Output Multiplier

Output Multiplier		
5 year	10 year	20 year
1.35	1.49	1.49

Table 2 provides a summary of new, relocated, indirect and induced, and total projected new enterprises created over a 20 year time period.

Table 10: Projected Number of Direct, Indirect and Induced Enterprises

Time Frame	# of New Enterprises	# of Relocated Enterprises	# of Direct New Enterprises	Total # of Indirect and Induced New Enterprises	Total # of New Enterprises
First 5 years	60	60	120	42	162
After 10 Years	90	90	180	87	267
After 20 years	120	120	240	117	357

³ The Oxford Economics (OE) model takes an approach between what econometricians call a “statistical vector auto-regression (VAR) model” at one end of the macro-economic modeling spectrum, and a computable general equilibrium (CGE) model on the other end. This means simply that the OE model forecasts well both short-run behavior and long-run relationships by integration of the statistical components of the model. The main advantage of the OE model is that it provides both a forecasting tool and a tool for policy analysis. Data sources include the World Bank, the Asia Development Bank, in-country sources, and others. It is important to note that all data used for the baseline forecast can be both verified and changed if needed or desired.

Using average output data collected in the CCIAS survey it was assumed that each enterprise will produce approximately \$1,686,162 (\$FY 2007) or approximately \$2,973,163 (\$FY 2012)⁴ in annual output. Based on these projections, total output in Lebanon is projected to increase by as much as \$480 million per year for the first five years and as much as \$1.06 billion per year, 20 years after the original investment (See Table 3).

Table 11: Total Direct, Indirect and Induced Output Increase (\$M FY2012)

Time Frame	Total Direct Annual Output Increase (\$M FY 2012)	Total Indirect and Induced Annual Output Increase (\$M FY 2012)	Total Output Increase (\$M FY2012)
First 5 years	\$357	\$123	\$480
After 10 Years	\$535	\$260	\$795
After 20 years	\$714	\$347	\$1,061

b. Employment / Personal Income

Based on average labor counts attained from the CCIAS survey data for industries in the South of Lebanon and Lebanon as a whole, we assumed that all enterprises on this new investment zone will represent 12 new employment opportunities for the region. Most of the assumed relocated industries represent approximately 6 employees, and are assumed to grow to twelve when operating in the industrial zone. Based on these estimates, in addition to creating additional direct output and tax revenue for the government, it is estimated that over a 20 year time period the formation of this industrial zone will return approximately 2220 direct jobs (Table 5) to the region.

In addition to the direct jobs, it is assumed that increased income and disposable personal income to the region induce additional consumption and thus increased employment across Lebanon. Using USAID's version of the OE model a multiplier was calculated on increases in personal disposable income to the region. As seen in Table 4, the estimated regional multiplier on direct employment for the Country of Lebanon is approximately 2.09. Put another way, for every new direct job that will be created in the industrial zone over a 10 year time period, will result in an additional 1.03 indirect and induced jobs in Lebanon.

Table 12: Personal Disposable Income Multiplier

Personal Disposable Income Multiplier		
5 year	10 year	20 year

⁴ \$FY 2012 output assumes an average 12% increase in average annual output between 2007 and 2012. The estimated increase is based on the increase in average annual output between 1998 and 2007 as provided by CCIAS and Lebanese government survey data.

1.60	2.03	2.09
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Table 5 provides a summary of new, relocated, indirect and induced, and total projected new employment over a 20 year time period.

Table 13: Total # of New Jobs Created

Time	# of New Employment from New Enterprises (Jobs)	# of New Employment from Relocated Enterprises (Jobs)	Total # of New Direct Employment (Jobs)	Total # of New Indirect and Induced Employment (Jobs)	Total # of New Employment (Jobs)
First 5 years	720	360	1080	645	1725
After 10 Years	1080	540	1620	1670	3290
After 20 years	1440	720	2160	2344	4504

Using average personal income data collected in the survey, it was assumed that each employee will earn on average \$7,492 (\$FY 2007) or approximately \$13,210 (\$FY 2012)⁵. Based on these projections, total annual personal income in Lebanon is projected to increase by approximately \$23 million per year for the first five years and by approximately \$60 million per year 20 years after the original investment (Table 6).

Table 14: Total Personal Income Increase (\$M FY 2012)

Time	Total Direct Personal Income Increase (\$M FY2012)	Total Indirect and Induced Personal Income Increase (\$M FY2012)	Total Personal Income Increase (\$M FY2012)
First 5 years	\$14	\$9	\$23
After 10 Years	\$21	\$22	\$43
After 20 years	\$29	\$31	\$60

c. Tax Revenue

This analysis assumed a 15% corporate tax rate on corporate profits and a 24% personal income tax rate on all employee earnings⁶. Annual profits on revenues were conservatively assumed to be approximately 15%. Based on these tax rates and

⁵ \$FY 2012 assumes an average 12% income in average annual Estimate's for the growth in annual income between 2007 and 2012. Annual income between 2007 and 2012 was projected to grow at same rate as output over this time period. \$FY 2012 output assumes an average 12% increase in average annual output between 2007 and 2012. The estimated increase is based on the increase in average annual output between 1998 and 2007 as provided by CCIAS and Lebanese government survey data.

⁶ Income tax paid by employees based on average income of \$7500 is around 3% equal to \$225/employee/year. An additional tax will be paid by employers to the National Security and Social Fund (NSSF) which is equal to 21% of the employee income = \$1575/employee/year

annual output and income projections outlined in the sections above, Tables 7 and 8 include projections for annual corporate and personal income tax increases over the first 20 years of the investment.

All firms that will be operating on the industrial zone will be both registered and paying the expected corporate and personal income tax rates. In projecting the increases in corporate tax revenue an assumption was made that approximately 25% of the firms that will be relocating to this industrial from other locations in Lebanon, are already paying corporate and income taxes. As such the actual increase outlined in tables 7 and 8 Personal and Corporate tax revenue is slightly less than the total number of personal and corporate income taxes collected.

Table 15: Increase in Government Corporate Tax Revenue

Time Frame	Total Corporate Output Increase (\$M FY2012)	Before Tax Corporate Income on Revenue (\$M FY 2012)	Increase in Government Tax Revenue from Corporate Income (\$M FY2012)
First 5 years	\$480	\$72	\$10
After 10 Years	\$795	\$119	\$16
After 20 years	\$1,061	\$159	\$22

Table 16: Increase in Government Personal Income Tax Revenue

Time	Total Personal Income Increase (\$M FY2012)	Increase in Government Tax Revenue from Generated Personal Income (\$M FY2012)
First 5 years	\$23	\$5
After 10 years	\$43	\$10
After 20 years	\$60	\$14

d. Return on Investment (ROI)

Based on the following line items (Table 9), the total up-front and recurring cost of this investment was estimated to be approximately \$33 million over a 20 year time period.

Table 17: Total Cost of Investment (\$M FY2012)

Total Cost of Investment (\$M FY 2012)	
Cost of Land	\$9
Total Infrastructure Upgrade Cost	\$14
Annual Infrastructure Maintenance (\$0.5M for 20 Years)	\$0.5
Total Investment over 20 years	\$33

When analyzing the full cost of an investment, in addition to the actual direct spending, one has to account for the return on investment that is being forfeited (opportunity cost) when tying up capital in this industrial zone. The discount rate used in Lebanon when calculating the opportunity cost of investment is proportional to the expected annual return on investment assumed in Lebanese markets. For the purpose of this analysis we assumed a 7%⁷ discount rate and applied it to the upfront and recurring costs outlined in Table 9. As a result, the true cost, taking into consideration the opportunity cost of this investment, is projected to reach as high as \$110 million over 20 years (Table 10). Another words, for investors to realize above market returns on their investment, they will need to realize total \$ returns that are greater than \$110 million over 20 years.

Table 18: Total Long-term Cost of Investment

Total Cost of Investment	
Time Frame (Years)	Total Costs
5	\$35
10	\$52
20	\$110

The projected annual returns on their investment were calculated by making the following assumptions around profit, tax and investment share ratios.

- Annual profits on revenues collected within the industrial zone were estimated to be approximately 15%;⁸
- Corporate tax rate on all profits earned from business operations in the industrial zone is estimated to be 15%⁹;
- For their investments, it was estimated that investors would be entitled to about 10% share of all remaining after tax income¹⁰.

⁷ Lebanon Central Bank (weighted average 2009 - 2012)

⁸ Ministry of Finance - Statutory Tax Rates on Business Income - Corporations and limited liability companies

⁹ Ministry of Finance - Statutory Tax Rates on Business Income - Corporations and limited liability companies

¹⁰ Ministry of Finance - Statutory Tax Rates on Business Income - Corporations and limited liability companies

Table 19: Annual After Tax Income on Investment (\$M FY 2012)

Time (Years)	Total Direct Output \$M FY2012	Income on Revenues (15%)	Income after Corporate Taxes (85%)	Annual After Tax Income on Investment (10%)
5	\$357	\$54	\$45	\$5
10	\$535	\$80	\$68	\$7
20	\$714	\$107	\$91	\$9

Based on these assumptions, it is estimated that investors will realize a full return on their investment after approximately 8-9 years (60% after five years), profits of approximately 10 % after 10 years, and 40% after 20 years above the market (Table 12).

Table 20: Projected Return on Investment (ROI) Ratio

Return on investment (ROI)	
Time (Years)	Private Investment
5	0.6
10	1.1
20	1.4

Over a 20 year time period, this would mean an additional above market return on their investment of approximately 2%. Given the economic, political and infrastructure related risk, this return may not be sufficient to attract private sector participation.

As a result, in order to incentivize private sector participation in this investment, CCIAS has proposed an alternative financing strategy. CCIAS has proposed that 40% of the initial investment amount would originate from the investors' equity. The remaining 60% would be raised through a combination of publicly and privately funded loans. 40% of the loans would be financed through subsidized loans by the Lebanese government at an interest rate of 1.5%¹¹. The remaining 20% would be raised through commercial loans from banks with the natural market interest rates of approximately 6%. Based on this strategy, the full potential cost, taking into consideration the opportunity cost of this investment, is projected to be reduced significantly to \$75 million over 20 years (Table 13). Another words, for investors to realize above market returns on their investment, they will need to realize total \$ returns that are greater than \$75 million over 20 years (Table 13).

¹¹ Current Interest rate under the Banque du Liban subsidized loan program

Table 21: Total Long-term Cost of Investment

Total \$ Cost of Investment Under the CCIAS Financing Strategy	
Time (Years)	Equity and Financing Investment (\$M FY 2012)
5	\$32
10	\$43
20	\$75

Based on these assumptions, it is estimated that investors will realize a full return on their investment between 7 and 8 years (70% after five years), profits of approximately 30 % after 10 years, and 100% after 20 years above the market (Table 14).

Table 22: Projected Return on Investment (ROI) Ratio

Return on Investment (ROI) Ratio Under the CCIAS Financing Strategy	
Time (Years)	Private Investment
5	0.7
10	1.3
20	2.0

Over a 20 year time period, this would mean an additional annual above market return on their investment of approximately 5%.

IV. Conclusion

The economic analysis of this investment and regulatory change shows an overall benefit to the Lebanese economy. Assuming a \$33 million investment by the private sector, a new industrial zone is projected to increase regional output, employment, and corporate and personal income tax revenue for the Lebanese government (Table 15).¹²

¹² Estimates of increases in output and employment did not take into consideration any of the additional environmental benefits that could be realized if the industries are required to operate in specific zones with better infrastructure, where industries are more likely to register their operations and the government will be able to regulate emissions more effectively.

Table 23: Increase in Output, Employment and Government Tax Revenues

Time Frame	Total Direct, Indirect and Induced Annual Output Increase (\$M FY2012)	Total Direct, Indirect and Induced Employment Increase (Jobs)	Annual Government Tax Revenue Increase (\$M FY 2012)
Years 1-5	\$480	1725	\$16
Years 6-10	\$795	3290	\$28
Years 11-20	\$1,061	4504	\$38

With no public sector financial support, investors are expected to see a payback period of approximately 8-9 years, profits of up to 10% after 10 years and 40% after 20 years, above average market returns. Given the economic, political and infrastructure related risk, this return may not be sufficient to attract private sector participation.

Conversely, if local municipalities or the Government of Lebanon could guarantee a low or interest free loan to investors, the total cost and risk of this investment could be reduced significantly.

V. Advocacy Recommendations

The objective of the RIA/Economic Analysis was to support the CCIAS with “a data point” in their proposal to government stakeholders and potential investors on the cost and benefits of this project and the need for their investment and support. Given substantial return in the form of output, employment and government tax revenue, the working group recommended that CCIAS reach out to government stakeholders for support and request financial assistance in the form of low interest loans in order to help reduce the risk and make this investment more attractive to private sector participants. With public sector regulatory and financial support for this investment, CCIAS will have a better case for attracting private sector investors to take on the risk of purchasing, constructing and maintaining the new industrial zone, while reducing the environmental footprint of the industrial base in Southern Lebanon.